



Great Northern Highway (H006) Upgrade Ord River North Section SLK 2922.12 to 2950.05: Annual Project Sustainability Report 2020-2021

This annual report covers the period from July 2020 to July 2021. A previous annual sustainability report was prepared for the project for July 2019 to July 2020

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About this Report

This report has been prepared by the WBHO-I Infrastructure Pty Ltd (WBHO-I) project team on behalf of Main Roads Western Australia (MRWA). This report forms part of Main Roads' annual sustainability reporting which is integrated into its Annual Report. The report content is prepared in accordance with the Global Reporting Initiative (GRI) principals. Main Roads processes determined which aspects are Material and to be reported on by the project.

Sustainability Management for the Project is formalised through a detailed Sustainability Management Plan. The framework of this Plan is designed around the Infrastructure Sustainability Council of Australia (ISCA) Ratings Scheme.

The project is required to monitor and self-assess a Design and As-Built (construction) rating for sustainability performance using the Infrastructure Sustainability Council Australia (ISCA) framework and version 2.0 Infrastructure Sustainability (IS) tool.

Introduction

On behalf of MRWA Kimberley region, WBHO-I is upgrading approximately 26 km of the Great Northern Highway (GNH) between Straight Line Kilometre (SLK) 2922 and 2950. This project is referred to as the Ord River North Project (the Project). This section of Great Northern Highway was identified as substandard, given its narrow width and excessive edge wear. The project will widen, reconstruct and realign the highway to further improve safety and efficiency for road users.

The Ord River North Project is located in the Shire of Halls Creek in Western Australia, approximately 2,150 km northeast of Perth, 550 km southwest of Darwin and 200 km south of the Kununurra town site.

This project has been broken down into to Separable Portions, SP1 & SP2. The first portion of the project known as SP1 (SLK 2922.12 to SLK 2930.22) was completed in 2019.

This portion of the project known as SP2 (SLK 2930.22 to SLK 2944.02) was awarded in April 2021 with Practical Completion anticipated for December 2021.

This report covers the 2020/2021 financial year and therefore only includes the three months of data for collected for SP2 since project works commenced for in April 2021.

The Project Team is committed to delivering to a high quality and shares Main Roads' goals for sustainable development, in particular the reduction of the project's Environmental Footprint and the further development of sustainability culture within the workplace.

Key sustainability drivers include:

- Reduce the materials footprint of the project
- Reduce carbon emissions during the construction works
- Engage with local stakeholders in a positive manner
- Improve employment and business opportunities for Aboriginal persons in line with the Indigenous Procurement Policy and Main Roads targets.

These sustainability drivers align with the following Sustainable Development Goals (SDGs):

- SDG 8 Decent work and economic growth
- SDG 9 Industry, innovation and infrastructure
- SDG 10 Reduced inequalities
- SDG 12 Responsible consumption and production

Highlights

The Ord River North Project has and will continue to result in:

- Strong Indigenous employment (32% in the 2018 and 2019 calendar years) and outcomes for the region, building on participation levels achieved at previous projects in the region such as Maggie Creek
- Complement other significant road improvements within the region, including Maggie Creek to Wyndham and the Bow River Bridge, to improve safety and reduce journey times
- Single season project completion for SP1 (2019) and SP2 (2021). Single season completion meant the project did not encroach into the wet season, meaning reduced erosion risk and fewer access restrictions
- Reduce the number and severity of road traffic accidents, in line with the State Government's *Driving Change – Road Safety Strategy 2020-2030* by widening the seal
- Reduce vehicle operating and maintenance costs due to an upgraded road surface that meets current design standards for this class of road
- Reduce travel times and improve journey time reliability
- Support economic growth with productivity benefits for freight and tourism
- Improved freight routes.

The project constructed road train turn arounds in response to the risk of increased bush fires. The effects of climate change are such that bush fires are becoming an increased risk to road users. Bushfires are common in the summer months. They move quickly and can be very unpredictable. The inability of trucks to turn around in such circumstances has been considered as part of the design. Due to the presence of the adjacent passing lane and retention of existing, setback pavement, the project has accommodated the ability for U-turn movements for vehicles up to 53.5 metre (m) road train (in the parking area).

Key sustainability metrics and highlights for the project are discussed below.

Social, Environmental and Economic

- Improved safety and access
- Increased productivity, freight reliability and efficiency for the transport industry
- Continued employment and business opportunities for the Kimberley region, local Aboriginal peoples and business.

Economic

Approximately 20% from the project value for SP-1 (\$30.2M) was local spend. WBHO-I's procurement procedure has been revised to ensure sustainability initiatives of subcontractors are assessed prior to award of work. Information sessions were delivered during the works to share opportunities of construction projects associated with sustainability principles and the ISCA framework.

Social

Consistent with previous projects in the region, including Maggie Creek to Wyndham and Bow River Bridge, The Ord River North Project provides a more reliable road network and continued employment for the local community.

During delivery of the project, WBHO-I reached unprecedented Aboriginal participation rates.

An average of 32 percent of the onsite workforce and more than 15 percent of contract spend went to Aboriginal businesses over calendar years 2018 & 2019 (25 percent local, 7 percent non-local). Due to site set up for the commencement of SP 2 from April the figures for the 2020/2021 timeframe were lower. An average of 7% of the onsite workforce was Aboriginal and more than 3% of contract spend went to Aboriginal businesses. These figures are expected to rise as the project progresses to meet the target of 30% indigenous employment.

To date, the project has provided training for 13 Aboriginal workers to enter the road construction industry and gain valuable skills and experience.

Environmental

The design used material properties to ensure a balanced cut to fill was achievable. As a result, there was minimal cut to spoil.

Overview

The Ord River North Project is the upgrade of approximately 26 km of the GNH between SLK 2922 and 2943 by WBHO-I on behalf of MRWA Kimberley region. This section of Great Northern Highway was identified as substandard, given its narrow width and excessive edge wear. The project will widen, reconstruct and realign the highway to further improve safety and efficiency for road users. The upgrade will provide a higher level of serviceability, including full seasonal access and improved safety and efficiency for road users. The \$98.14 million project is jointly funded by the Australian and State Governments.

The Ord River North Project is located in the Shire of Halls Creek in Western Australia, approximately 2,150 km northeast of Perth, 550 km southwest of Darwin and 200 km south of the Kununurra town site. The project area is shown in Figure 1.

Key stakeholders to the project are listed in Appendix 3. Public information is available at [Great Northern Highway Upgrade - Ord River North | Main Roads Western Australia](#).

The project works include:

- Investigation,
- Design and
- Construction activities.

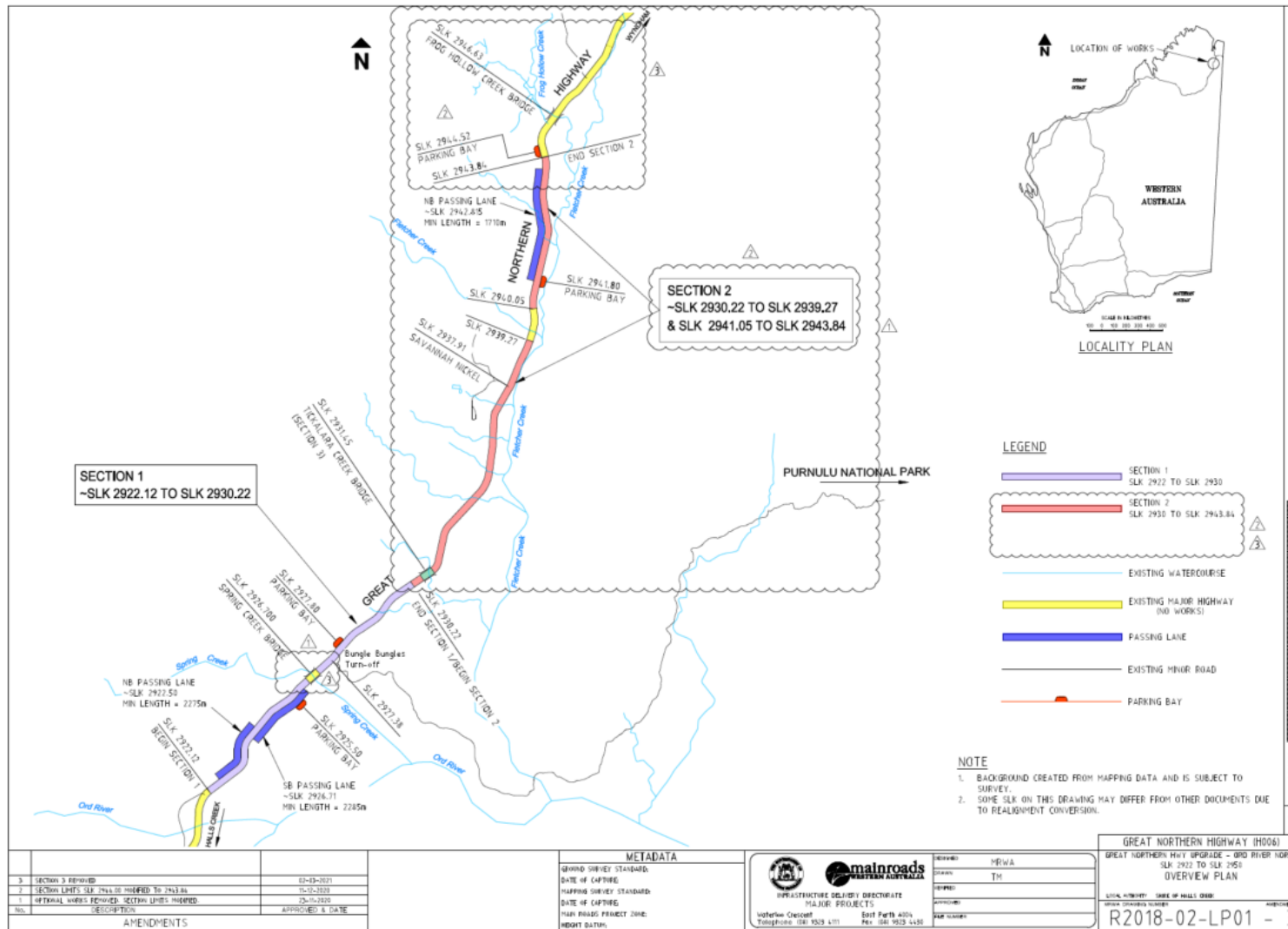


Figure 1: Project Area

Overall approach to Sustainability

WBHO-I recognises that activities related to this project can have a significant and long-term effect on the environment and social aspects within the local communities. WBHO-I applies a holistic approach to sustainability by integrating the concept into our core business strategy.

The WBHO-I project team is committed to the following sustainability practices:

- Providing safe communities and positive workplaces for our employees and subcontractors.
- Preventing and mitigating pollution and degradation, and anticipating and adapting to climate impacts, we avoid potential operational delays, remediation costs, fines and legal fees, and enhance our relationships with the communities and markets in which we operate;
- Actively being involved with the communities in which we work by seeking local participation in our workforce and supporting community events.
- Acting with integrity, honestly and respectfully in all relationships with our stakeholders.
- Nurturing a united and collaborative culture within the business to ensure all our employees are supported to achieve excellence and integrate governance, economic, environmental and social considerations into their roles.
- Innovation is seen as a key to success and allows the company to deliver services that satisfy the governance, economic, environmental and social needs of our clients.
- Using resources efficiently by minimising waste and promoting the delivery of environmentally and socially responsible projects.

WBHO-I has developed Core Values which is communicated to its workforce, these are the values that all WBHO-I employees and our subcontractors are expected to uphold while working on any WBHO-I project.

Sustainability on this project has been managed through the implementation of the Sustainability Management Plan (SMP) with site staff and support from consultants as required. Resources, roles and responsibilities are defined in the SMP. Initiatives outlined in the SMP aim to address the following:

- Energy or carbon reduction from both the operation and use of the infrastructure
- Use of recycled materials during construction
- Increase ecosystem services and ecosystem resilience by maintaining function of biodiversity through retention, restoration, linking habitats or creation of diverse habitats
- Other material sustainability issues.

WBHO-I considered social, environmental and economic matters to ensure the project works are consistent with sustainability principles as part of the planning and design the project works. WBHO-I continues to:

- Implement sustainability opportunities described in the SMP (2019)
- Use the ISCA Infrastructure Sustainability (IS) Rating Tool to report on the level of sustainable practice embedded within the project works (for design and as built IS ratings).
- Monitor all waste during construction, and provide a monthly report detailing the volumes and categories of waste produced (refer monthly reporting).
- Provide detail in the monthly report on progress towards achieving sustainability initiatives.

The project has reported on its performance. It was not required to undergo formal verification under the IS rating scheme. WBHO-I has tracked performance to achieve an Infrastructure Sustainability rating score of at **least 50**.

In achieving the rating, the following Infrastructure Sustainability credits have been targeted as a minimum:

All Leadership and Management (Lea) credits – level 1;

- Ecn-1 Option Assessment – Level 1;
- Res-2 Climate and natural hazards – Level 2;
- Ene-1 Energy Efficiency – Level 1 and 5% reduction target;
- Wat-1 Water Use – Level 1 and 5% reduction target;
- Rso-6 Material Lifecycle Impact Measure and Management – Level 1 and 5% reduction target;
- Rso-1 Resource Strategy Development – Level 1;
- Rso-4 Resource Recovery – Level 1;
- Leg-1 Leaving a Lasting Legacy – Level 1; and
- Con-2 Urban and Landscape Design context – Level 1.

Risks, Challenges, Benefits and Opportunities

Challenges and risks for the project stem from its setting in a remote region in the Kimberley, on the Great Northern Highway near Turkey Creek/Warmun. The site is located in the tropics and subject to heat, tropical storms and cyclones.

Materials, their handling (source and footprint), energy and water use are important considerations for the project. Climate change adaption, heritage and stakeholder engagement are important for good project outcomes for this project.

Key benefits:

- Protect and enhance heritage values where possible
- Seek opportunities to work with stakeholders to enhance project outcomes (e.g. in heritage, procurement, local employment and business engagement)

Sustainability priorities and opportunities included:

- Reduce energy use (e.g. fuel used in earthmoving or haulage) during construction and operation
- Reduce water use during construction and operation
- Climate change risks (e.g. fire and flood risk) in design and incorporate appropriate adaption responses (e.g. truck turn around space during fire and construction timing)
- Optimise resources and seek opportunities for reuse/ recycling of local materials
- The clearing footprint has been minimised in order to meet environmental regulatory requirements, however where possible the project will continue to look for opportunities to retain trees and further reduce the clearing footprint. All reasonable efforts have been made to save Boab Trees (*Adansonia gregorii*) impacted by the proposed works.

A sustainability workshop was held at Main Roads' Don Aitken Centre on Wednesday 10th April 2019 and was attended by representatives from WBHO-I, BG&E, Golders, 360 Environmental and Main Roads. A number of initiatives were discussed with many incorporated into the 100% design. These include the following:

- **Culvert maximum pipe size** – SP 1 contains existing culverts ranging in size from 600 mm x 600 mm RCB's right up to 3 x DN1800 CSP's. With a few exceptions, most culverts are to be replaced with Reinforced concrete pipe (RCP). During the tender design phase (which included SP1, SP2 and SP3) investigations were held into the availability of various sized RCP's from regional suppliers. It was noted that the nearest supplier (Darwin) only stocked pipe up to DN1800. To source larger pipe would require transportation from Perth or Queensland. This would result in significant freight effort which has a comparable penalty with respect to sustainable design objectives. It was further determined that limiting pipe diameter further (to maximum DN1650) may also enable smaller machinery to be used on site which in turn aligns better with the project's sustainability objectives. The maximum culvert size across the whole project was therefore set at DN1650 at tender and has remained as such right through the detailed design process.
- **Headwall height standardisation** – the construction of in-situ concrete end treatments ('headwalls') requires the use of formwork which needs to be cut to suit. Through standardising end headwall heights as much as possible the project is able to maximise the reuse of formwork and with it, minimise the extent required. Even increments of RCP culvert units – Concrete pipe comes in standard lengths, typically 2.44 m for rubber ring jointed pipe. Actual culvert length is dictated by a number of variables including invert levels, the road batter extents and clear zone requirements. It is extremely unlikely that matching a culvert to the proposed design variables would result in an even number of whole culvert units. Attempting to reduce the length of culverts to the absolute minimum required the cutting of concrete pipe units onsite and the production of waste material. It was therefore proposed to nominally lengthen culverts to the nearest full increment of 2.44 m unit lengths. This negates the need for additional construction effort and eliminates wastage.
- **RiSC assessment of roadside hazards** – The Roadside Impact Severity Calculator (RiSC) is software developed by the Department of Transport and Main Roads (QLD) for performing a quantitative economic evaluation of hazardous roadside objects by calculating a benefit cost ratio for treatment options. Whilst the elimination or treatment of all roadside hazards has obvious safety benefits it is not necessarily viable when considering the likelihood and overall cost of an impact. Great Northern Highway (Ord River to Turkey Creek section) is located in a relatively remote part of Western Australia. Consequently vehicle volumes (and in turn the likelihood of an errant vehicle striking a roadside hazard) are low in comparison to the metropolitan area. The major roadside hazards identified on this project are culverts, high fill embankments and steep cuttings in rock.

The manner in which such hazards have been assessed are as follows:

- **Culverts** – mitigation of the risk would require lengthening the culvert such that headwalls are located outside the clear zone. The high speed environment has clear zones of 11.0 m for 1 in 4 fill batters and 8.0 m for 1 in 6 batters. To lengthen culverts outside these zones in all instances requires additional materials, additional freight and additional construction effort. RiSC assessment found that in many instances culverts could be reduced in length (bringing headwalls within the clear zone).
- **Fill batters** – Fill batters that are steeper than 1 in 4 would typically be flattened to either make them 1 in 4 (traversable) or 1 in 6 (recoverable). The reference design originally had high fill batters with slopes as much as 1 in 3. These required the use of road safety barriers to protect errant vehicles from the risk of rollover crashes. At detailed design the requirement for road safety barriers to protect such features has been relaxed, reducing the extent of barrier installation and the ongoing maintenance associated with major and minor impacts.

Notwithstanding the highest fill batters have been flattened to 1 in 4 to provide a safer roadside environment

- **Rock cut batters** – the backslope of cut drains would generally be flattened to make the overall drain shape traversable for errant vehicles. However when the drain is located in rock material this results in the need for additional clearing, rock breaking machinery, extended duration of construction activities and the haulage of rock either for reuse elsewhere, or to spoil. RiSC assessment found that the location of concern, just north of Spring Creek Bridge, did not warrant further treatment and could be retained in its current state.
- **Parking Bay 1 pavement retention** – There are two existing parking bays in SP1 that are to be retained but brought up to standard. In general the prevailing pavement was deemed to have sufficient residual life for reuse. However Parking Bay 2 is too close to the Highway to meet the geometric requirements of Main Roads current standards and shall be fully reconstructed. Parking Bay 1 on the other hand is sufficiently set back from the Highway to enable retention of the main parking area pavement, with only the two intersections requiring geometric modifications. This has enabled retention of the existing pavement for a large portion of the bay. This minimises haulage of new pavement material and the carting of redundant material to spoil.
- **Kerbing and scour prevention** – the Kimberley Region is subjected to intense rainfall conditions that produces significant volumes of runoff. This runoff can result in scour of the road formation or other roadside features, requiring ongoing maintenance to repair the damage. The project works incorporate kerbing at high risk locations including the low side of the Highway where superelevated and at passing lanes on the side where two or more lanes slope towards. Though an additional material cost, the use of kerbing enables road surface runoff to be conveyed to controlled outfalls (in this case rock protected kerb openings), minimising the risk of damage to the road environment and with it, providing a more robust asset that requires less ongoing maintenance.
- **Parking Bays 1 and 2 can accommodate U-turn movements** for most heavy vehicle combinations. The effects of climate change are such that bush fires are becoming an increased risk to road users. The inability of trucks to turn around in such circumstances has previously resulted in fatalities in other parts of the state. Due to the presence of the adjacent passing lane and retention of existing, setback pavement, Parking Bay 1 can accommodate U-turn movements for all vehicles up to 53.5m road train. Parking Bay 2 is located closer to the Highway – which has a standard two-lane configuration at this point. The slightly tighter geometry can accommodate U-turn movements up to a 36.5m road train. Triple road trains would be able to discard the rearmost trailer and comfortably make the movement.

Material Sustainability Issues

The material sustainability topics for the project are outlined in the project summary presentation, shown in Attachment 5.

Environmental Aspects Performance

At a glance

Aspect	Year to 30 June	Total, for Project
Forecast Clearing (ha)	59.6	59.6
Clearing permit allowance (ha)	Nil	87.7
Actual clearing to date (ha)	26.22	54.32
Rehabilitation/revegetation planned (ha)	Nil	0.6
Actual rehabilitation/revegetation to date (ha)	Nil	Nil
Environmental offset via Monetary contribution actual (\$)	Nil	Nil
Total Water Consumption to date (kL)	20.93	134,234
Total water licence allowance (kL)	74,000	74,000 annually
Total GHG emissions (scope 1, 2 & 3) to date (t CO ₂ -e)	300	657
Total energy consumption to date (mj)	4,262	9,330
Total quantity of recycled content used in project (t)	2,904	12,504
Total imported materials used in project (t)	9,660	148,085
Total waste generated by project (t)	14	14

Environmental Context

The Kimberley Region of Western Australia is characterised as an arid to semi-arid monsoonal climate dominated by two seasons with a short transitional period. The wet season is hot and humid with high rainfall, extending over the months November to April. The dry season occurs from May to October. Extreme weather events are a significant component of the Kimberley climate where tropical cyclones and tropical storms can bring heavy and sustained rainfall. It is common for a large proportion of the regions rainfall to be recorded in one single event, leading to extensive flooding of rivers, creeks and roadways.

There are no Environmentally Sensitive Areas, Nature Reserves or any other conservation areas within or in the vicinity of the project area (Appendix 1). The nearest conservation area is Purnululu Conservation Reserve, which is located at least 23 km to the east of the project area at its closest point. As a result, clearing did not impact on the environmental values of any conservation areas.

Four fauna species of conservation significance were identified as likely to occur within the project area (Appendix 2). These species include the Rainbow Bee-eater, Gouldian Finch, Spectacled Hare-wallaby and the Short-tailed Mouse. Project works did not impact the protected fauna species because project works did not:

- Increase the extent or prevalence of threatening processes to any of the above species.
- Reduce the area of occupancy of species population.
- Fragment an existing important population into two or more populations.
- Impact habitat critical to the survival of the species.
- Disrupt the breeding cycle of an important population.

No species listed as Threatened under the *Wildlife Conservation Act 1950* (WC Act) or *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) were recorded within the project area.

Environmental Management

Project specific environmental management actions have been developed to manage all impacts and these are outlined in the Environmental Management Plan (EMP). Standard management actions (i.e. record keeping and monitoring project implementation) are being implemented throughout the construction phase of the project. Supporting Management Plans include:

- Quality Management Plan
- Community and Stakeholder Engagement Plan
- Health and Safety Plan
- Aboriginal Participation Plan.

All works were carried out under the Main Roads State Clearing permit CPS 818.

The project design has been selected primarily to ensure the existing road is improved to meet Main Roads minimum design standards and to subsequently increase road safety. Selection of the final design also aimed to minimise required clearing impacts. The proposed works will enable high level serviceability and full seasonal access consistent with National Highway standards.

The following clearing mitigation methods were implemented for the project:

- Limiting clearing of vegetation to the area absolutely necessary for construction and safe operation of the project.
- Clear demarcation of clearing boundaries prior to the commencement of project activities to avoid over clearing.
- Utilisation of previously disturbed areas such as access tracks where possible to minimise clearing.
- Selective retention of large trees at the edges of clearing during construction where practicable.

Water Management



Turkey Nest and Standpipe

The project area is located within the Kimberley Regional Planning Groundwater Area. The project area lies within the Ord-Victoria sedimentary basins which are characterised by an extensive network of aquifers in which water quality and quantity vary significantly (DoW, 2010b). Potential impacts on groundwater could occur during construction through dewatering and abstraction of groundwater, which may reduce the quantity of groundwater available for other uses. Impacts on groundwater availability are readily manageable

through bore and dewatering licencing and monitoring during construction. The storage and use of chemicals within the project area had the potential to adversely impact groundwater quality through spills and leaks. Groundwater quality may also be impacted by inappropriate or inadequate drainage during construction. These impacts were adequately managed through standard construction management techniques and procedures, including locating storage of chemicals and hazardous substances in adequately bunded areas away from waterways and areas where rainfall runoff is likely to occur, regular inspection of drainage sumps for sediment and other contaminants, and site surfaces to be shaped to allow for natural drainage to avoid ponding or pooling on site

The project objective was to minimise water use and to maintain groundwater quality so that existing and potential environmental values, including ecosystem maintenance, are protected.

Source	Year to 30 June	Total for Project
Water purchased from the scheme in litres	Nil	Nil
Water pumped from bores in litres	20.93 kL	134,234 kL
Water pumped from rivers, lakes or harvested in litres	Nil	Nil
Recycled or wastewater use (typically from another industry) in litres	Nil	Nil

Carbon Emissions & Energy

The project has reduced carbon emissions where possible. Carbon emissions were reduced by:

- Employing local staff and subcontractors minimising length of commutes. Securing water sources from nearest possible bore.
- Sourcing local materials and reusing materials on site wherever possible to minimise haulage
- Minimising material imports.

Energy usage by source in mega joules	Year to 30 June	Total for Project
From fuel use (mj)	9,185,090	32,868,395
From electricity (mj)	Nil	Nil
Energy saved (mj)	Nil	Nil

**Note: Generators use for electricity due to remoteness of the site*

Materials & Recycling

Waste is currently being stockpiled on site in the borrow pits. Decisions are underway for how to efficiently dispose of each waste stream. Based on current stockpile sizes, the biggest waste stream from the project is demolition and construction associated waste, followed by green waste. Green waste is to be reused on site where possible.

Materials have been recycled where possible i.e. steel and wood. Contractors' waste is required to be minimised as part of the procurement processes.

The main energy saving and greenhouse gas emission reducing initiative has come from the optimisation of materials and reducing material handling (and the associated greenhouse emission savings). A Resource Efficiency Strategy (RES) and Resource Efficiency Action Plan (REAP) considering waste, land and materials were written and implemented as part of ISCA credit Rso-1 Resource Strategy Development. These documents outline the overall management approach regarding materials and waste. Requirements under the Plan are as follows:

- Capture resource efficiency opportunities for embankment fill, pavement gravels, aggregate and drainage materials. Resource inputs and primary materials and potential opportunities on the project are:

- Embankment fill – earthworks models indicates overall surplus of material in general earthworks. Materials have been reused where possible to minimise waste generation.
- Pavement gravels – sub-base and basecourse are the most significant import material on the project. Sourcing has considered location relative to site the minimum haul distance.
- Aggregate – aggregates to seals sourced with consideration to location relative to site while meeting contract requirements.
- Drainage materials – source of precast pipes and mode of delivery taken into consideration.
- Tracking of these materials is through transportation records.
- Optimisation of topsoil use through reuse on-site.



Bow River Borrow Pit



Batch Plant

Material and Waste Statistics

Imported Materials	Year to 30 June	Total for Project
Sand (t)	Nil	341
Gravel (t)	9,660	40,000
Clay (t)	Nil	Nil
Limestone (including crushed) (t)	Nil	Nil
Crushed Rock (t)	Nil	3,650
Crusher Dust (t)	Nil	Nil
Aggregate (t)	Nil	2,168
Asphalt (t)	Nil	Nil
Concrete (t)	411	1090
Steel (t)	80	80
Precast concrete (t)	Nil	Nil
Emulsion (t)	Nil	Nil
Bitumen cutter (t)	Nil	5956
Bitumen (t)	Nil	5539
Glass (t)	Nil	Nil
Paint (t)	Nil	Nil
Topsoil (t)	Nil	Nil
Mulch (t)	Nil	Nil
Other (m3) – cement stab	314.4 m3	714.5 m3

Waste to Landfill	Year to 30 June	Total for Project
Waste to Landfill	*Waste being stockpiled (WS)	
Unsuitable material (t)	WS	WS
Existing seal / asphalt (t)	WS	WS
Roadside litter / municipal solid waste (t)	WS	WS
Commercial / industrial waste (t)	WS	WS
Green waste (t)	WS	WS
Concrete / kerbing (t)	WS	WS
Construction / demolition waste (t)	WS	WS
Contaminated material (t)	Nil	Nil
Asbestos (t)	Nil	Nil
General/Green Waste (t)	WS	14
Other (t)	Nil	Nil
Waste Recycled	Year to 30 June	Total for Project
Sand (t)	WS	WS
Road base (t)	WS	WS
Asphalt (t)	WS	WS
Timber (t)	WS	WS
General waste (site office / Camp / roadside litter) (t)	90	318
Steel (t)	WS	WS

Concrete (t)	WS	WS
Green waste / mulch (t)	WS	WS
Plastic (t)	General Waste	General Waste
Other (t)	WS	WS

**There is no Recycling Facilities in Kununurra*

Imported recycled content	Year to 30 June	Total for Project
Sand (t)	Nil	Nil
Road Base (t)	Nil	9,500
Crumbed Rubber (t)	Nil	Nil
Recycled asphalt (t)	Nil	Nil
Steel (t)	Nil	Nil
Concrete (t)	Nil	Nil
Crushed Glass / beads	Nil	Nil
Limestone (t)	Nil	Nil
Plastic (t)	Nil	Nil
Green waste / mulch (t)	Nil	Nil
Topsoil (t)	Nil	Nil
Unsuitable material (t)	Nil	Nil
Other (t)	Nil	Nil

Noise (from construction and future operation)

Noise emissions occurred as a result of the construction of the project. Due to the remote nature of the project noise emissions had a minimal impact.

Dust & Air Quality

Standard industry practices have been implemented for the management of dust and air quality during construction activities, including:

- Monitoring of weather conditions when clearing activities are scheduled, construction activities may need to cease on days of extreme wind conditions.
- Employing construction methods that minimise dust.
- Applying control measures in dust prone areas by using water or stabilising agents whenever practicable.
- Cessation of all work when wind speed or conditions are such that preventative measures are unable to contain dust and win blown materials.
- Enforcement of speed limits on unsealed roads.
- Cleaning and keeping clean of roads and other access areas.
- Trucks carrying soils to or from the site are covered or wet down to prevent wind-blown dust.
- Water carts available at all times to carry out dust suppression activities to control and prevent excessive dust from earthworks operation.
- Stockpiling of topsoil, cleared vegetation and mulch only within designated areas. Soil stockpiles minimised.
- Temporary stabilisation of stockpiles of topsoil, trench spoil areas or any other areas where bulk earthworks have been completed but final trim works cannot be completed.
- Visual monitoring of excessive dust conducted during ground disturbance and construction vehicle activities.

Discharges & Spills

There were no discharges or spills. Spill kits were present on site in the event of a spill and were kept well stocked.

Vibration

Vibration monitoring occurred throughout construction in accordance with approved plans.

Light spill

Minimal night works occurred, reducing the impacts of light spill. Due to the remote nature of the project light spill had minimal impact.

Acid Sulphate Soils

The majority of the project area has an Extremely Low probability of ASS (AECOM, 2016a; AECOM, 2016b; AECOM, 2016c). Due to the low risk an ASS management plan was not considered to be required. WBHO-I has minimised excavations and avoid dewatering within and adjacent to waterways, where possible. No ASS has been encountered on the project to date.

Clearing & Rehabilitation

Clearing mitigation methods are discussed under Environmental Management. Rehabilitation has been undertaken in completed sections which has involved the careful management of topsoil, which is returned and contoured once sections are completed.

Contaminated sites

There are no registered contaminated sites within the project area (AECOM, 2016a; AECOM, 2016b; AECOM, 2016c).

Dieback

The project is not located within a dieback risk area.



Ticklara Creek Borrow Pit

Case Study

The cane toad (*Rhinella marina*) is an invasive, fast-breeding species that is toxic to many native animals. Cane toads are a Declared Pest, prohibited under s12 of the *Biodiversity and Agriculture Management Act 2007* (BAM Act), requiring them to be excluded from all of Western Australia. Since their initial introduction into Queensland to control insect pests of sugar cane, cane toads have proven to be highly invasive. Feral populations have established and spread in eastern and northern Australia, reaching as far west as the Kimberley in Western Australia (Department of PIRD, 2021). Anecdotally, a 360 Environmental zoologist has observed cane toads using ponds along the Gibb River Road as a refuge.

This knowledge informed partial rehabilitation of the Ticklara Creek borrow pit has been done. The borrow pit was ripped along the contour to slow run-off, minimise erosion and increase infiltration. This prevents water from ponding, reducing the available refuges for the cane toad population to establish.

Additionally, topsoil was returned to the borrow pit where possible. Rehabilitation of the Ticklara borrow pit is still ongoing.

Economic Aspects Performance

At a glance

Economic Aspect	Year to 30 June	Total for Project
Funding	\$30.2M	\$91M (SP1 & 2)
No. of vehicles per day	277/day – MRWA data	277/day – MRWA data
Travel Time Saving	TBC	TBC
Increase of vehicle capacity	TBC	TBC
Increase in cycling and pedestrian facilities (i.e. increase in PSP length)	Nil	Nil
<i>Workforce and Supply Chain</i>		
Number of people employed by supply chain at various stages of project	193	214
Total number of suppliers engaged	36	122
Total number of Indigenous Enterprise	9	13
Total number of Disability Enterprise	Nil	Nil
Buy Local Spend (to date)	\$150,000.00	\$5,796,854.37

Economic context

The Kimberley region has an increasingly diverse regional economy, with opportunities in many industries including; mining, construction, tourism, retail, agriculture, and rangelands. There are also challenges to the growth of the Kimberley including housing, health and wellbeing, and education and training. The Kimberley's Gross Regional Product is estimated at \$7.44 billion, which represents 2.51% of the state's Gross State Product (GSP).

The section of road being upgraded is part of the State's high-wide load corridor, making it key for freight transport. The road improvements will result in economic benefits through improved freight efficiencies and safety, as well as more reliable access to remote communities within the region.

Sustainable procurement for the project has been guided by WBHO-I's Supply Chain and Sustainability Policies. Under these policies all aspects of purchasing activities must undertake procurement that:

- Complies with all relevant local, State and Commonwealth legislation and regulations
- Considers the lifecycle of materials
- Supports local community projects and sustainable development
- Delivers long-term social, economic and environmental benefits to all stakeholders.

Key Economic Outcomes

The key project driver for upgrading the Great Northern Highway was Road Safety

Economic outcomes from the project included:

- Employment from project, in particular indigenous employment. An average of 32% of the onsite workforce in the 2018 and 2019 calendar years was indigenous.
- Economic development through the engagement of local businesses. 15% of contract spend in the 2018 and 2019 calendar years went to Aboriginal businesses, 25% of which were local (7% non-local)
- Freight efficiency outcomes through improved safety and full seasonal access resulting in increased efficiency for road users.

Sustainable Procurement and Buy Local

Sustainability in the procurement chain is key to achieving the project's sustainability initiatives. All contractors and subcontractors are required to provide information prior to engagement through the procurement chain which includes:

- The acknowledgement and understanding of the projects Sustainability Policy and Plans
- The relevance of IS credits and criteria
- Whether the business operates sustainably in any way e.g. solar power, recycled materials, electric vehicles, recycling of waste
- Whether the business assesses upstream sustainability of the products purchased for incorporation into products.

Climate Change Assessments

An independent review process conducted as part of the design of the Ord River North Project included feedback from government representatives, including Main Roads and the local government. Climate and natural hazard treatment options were incorporated as part of this process. Climate change is incorporated into the risk assessment and forms part of the risk register for the project.

An assessment of climate change impacts and Indigenous climate change adaption in the Kimberley region contributed to gaining an understanding of the climate and natural hazard risks potentially impacting the asset and local communities. Impacts of Climate Change on Indigenous people in the Kimberley region of North-western Australia will vary according to the level economic dependence on local environments. For communities that retain subsistence activities, such as hunting, fishing and traditional food harvesting, livelihoods and the cultural and social aspects of their way of life are vulnerable to climate-driven environmental changes (Leonard et al., 2013). The report determined the Kimberley is most at risk from tropical cyclones, flooding and wildfires, affecting remote communities and infrastructure. Indigenous adaptation planning for climate change requires:

- participatory planning processes that incorporate Indigenous traditions and customs
- the use of linguists, translators and interpreters for effective communication and
- research that accurately reflects Indigenous values
- the importance of stakeholders, collaborations and partnerships
- the need to address identified research needs and gaps
- the capacity of disaster management agencies.

The Commonwealth Scientific and Industrial Research Organisation (CSIRO) predicts climate change in WA to result in:

- hotter days and nights
- reduced rainfall in the southern region, but more intense rain periods
- more extreme weather conditions such as long periods of drought and severe storms, and

- more bushfires.

The design of the road considered the long-term effects of climate change on structures i.e. durability requirements for heavy vehicles. Polymer Modified Bitumen (PMB) is a constituent of Dense Graded Asphalt (DGA), which assists with the thermal expansion properties of the pavement. With increase of temperature associated with climate change, the thermal expansion properties of DGA assist with reducing the tendency for thermal cracking and thus improves the durability of the structure.

Drainage infrastructure has been designed to allow for future climate predictions. The area has been revegetated using native species endemic to the area. This will contribute to a reduction in the local heat effect. A more efficient road network reduces emissions. A 2019 study found that keeping road pavement good condition and reducing road roughness can reduce carbon emissions by up to 2% (Rutgers University, 2019).

Sustainable Transport

The effects of climate change are such that bush fires are becoming an increased risk to road users. Bushfires are common in the drier months. They can move quickly and be highly unpredictable. The inability of trucks to turn around in such circumstances has previously resulted in fatalities in other parts of the state. To account for this risk, the project has installed a turnaround/decoupling area for trucks in response to increased bush fires that are predicted for the region. These areas can accommodate U-turn movements for most heavy vehicle combinations up to 53.5m road trains (turnaround area one) and 36.5m road trains (turnaround area two). Triple road trains would be able to discard the rearmost trailer and comfortably make the movement at the turnaround area two, which has slightly tighter geometry than turnaround area one.

Benefits Realisation

Benefits realisation is outlined under Risks, Challenges, Benefits and Opportunities.

Technology and Innovation

The current Covid-19 pandemic has meant technology has been more heavily relied on for team communications and project meeting due to reduced travel. Weekly project meetings are conducted through Teams.

Equity and Distributional Impacts

Distributional impacts were experienced by local communities through Aboriginal employment and the engagement of local Aboriginal businesses, creating a positive impact within the region. These benefits are discussed further as a case study below.

Case Study

A key strength of this project has been the unprecedented Aboriginal participation and employment rates, providing economic benefit to local communities and wider region. Over the 2018 and 2019 calendar years an average of 32% of the onsite workforce was Aboriginal, and more than 15% of contract spend went to Aboriginal businesses. 25% of this engagement was local and 7% non-local. Works carried out during the 2020-2021 period reported lower Aboriginal engagement, however this is primarily due to the commencement and of SP2 in April, meaning the site was only operable for three months of the reporting period. During this time an average of 7%

of the onsite workforce was Aboriginal and more than 3% of contract spend went to Aboriginal businesses. These figures are expected to increase as the project progresses from the site set up phase and are forecast to meet the target of 30% indigenous employment.

The positive impacts of this project on local Aboriginal employment build on the success of previous project within the region, including Maggie Creek to Wyndham and Bow River Bridge, creating ongoing economic benefit for the local indigenous communities of the region.

Social Aspects Performance

At a glance

Social Aspect	Year to 30 June	Total for Project
Community Satisfaction to Project	Unknown – no negatives received	
No. of Stakeholders engaged with during project development	7	2
No. of complaints	Nil	Nil
No. of legacy commitments	Nil	2
No. of heritage sites in project vicinity	Nil	Nil
No. of heritage sites significantly impacted	Nil	Nil
No. of traffic safety incidents within project boundary	1	1
% of women in workforce	13%	13%
% indigenous in workforce	7%	32%
LTIFR	Nil	Nil
No. of hours training during project	Unknown (we trained people in different plant operations)	Unknown (we trained people in different plant operations)
No. of development employees and apprentices on the project	0	0
No. of employees (FTEs) sourced from local community	15	16

Social context

The project area is equidistant from Halls Creek and the community of Warmun, both located within the Shire of Halls Creek. This is a low-density location, with no immediate community adjacent to the works site that will be impacted.

The Great Northern Highway is a major route for freight travelling between Port Hedland and Kununurra and is the only sealed route between Derby and Kununurra. It is also a popular tourist route for visiting the East Kimberly during the dry season (April to September). The access road for the popular Bungle Bungles tourist attraction is also within the project area. Project planning, traffic management and engagement are carefully considered and mitigated impacts for road users.

The project is the third road upgrade to occur in the area in the past 5 years. The two previous projects were a section of Great Northern Highway between Maggie Creek and Wyndham completed in June 2019, and a new bridge over Bow River and parking area was completed in November 2018. The Maggie Creek project worked closely with the local community of Wyndham, achieving strong rates of Aboriginal and local participation in the workforce through contractor Dadaru. One of the aims of the Ord River project is to build on that experience, and create ongoing, additional opportunities for local participation.

Key stakeholders are listed in Appendix 1.

Community & Stakeholder Engagement

The overarching approach to stakeholder and community engagement is to provide accurate, timely and relevant information to all stakeholders, to ensure maximum awareness and understanding of the project, its aims and benefits.

Early advice and notice of the works' progress is critical in relation to traffic management which requires traffic to a single lane.

The community and stakeholder engagement objectives for the Ord River North project are to:

- Meet and/or exceed community and stakeholder expectations in relation to engagement
- Proactively share information with the community and stakeholders – a 'no surprises' approach
- Minimise the risk of issues escalating via early issue identification and mitigation
- Actively engage with the local community of Warmun.

Key messages include:

- Strong Indigenous employment and outcomes for the region, building on participation levels achieved at previous projects in the region such as Maggie Creek.
- Complement other significant road improvements in the region to improve safety and reduce journey times.
- Single season project completion for SP1 (2019) and SP2 (2021).
- Reduce the number and severity of road traffic accidents, in line with the State Government's 'Towards Zero' policy, by widening the seal.
- Improve road drainage by the construction and installation of culverts.
- Reduce vehicle operating and maintenance costs due to an upgraded road surface that meets current design standards for this class of road.
- Reduce travel times and improve journey time reliability.
- Support economic growth with productivity benefits for freight and tourism.
- Improved freight routes.

Addressing community concerns

Project updates were prepared and distributed to reflect key project milestones. Distribution was via roadhouses, local tourism operators, the Shire of Halls Creek, to the local Warmun community and via email to the project database.

Formal notification of traffic management are distributed via a Notification of Roadworks by the WBHO-I's Project Manager. The notices are communicated to:

- WA Police State Traffic Coordination
- WA Police Student Pedestrian Policy Unit
- MRWA Customer Information Centre
- MRWA Traffic Operations Centre
- MRWA Heavy Vehicle Operations
- MRWA Engineer Bridge Loading
- Wyndham Police
- St John's Ambulance
- Fire & Emergency Services
- Shire of Wyndham East Kimberley

In addition, the contractor's Community and Stakeholder Engagement Manager circulated information via the following mechanisms:

- Email to stakeholder and enquiry databases via Click Dimensions
- Updates to Main Roads WA website
- Visitor Management System (VMS) on site
- Notification to Main Roads Customer Information Centre, Traffic Operations, HVO as appropriate.

WBHO-I published contact information such as enquiries@mainroads.wa.gov.au and the Main Roads' Customer Information Centre (CIC) telephone number (138 138) as a point of contact for enquiries and complaints.

All issues reported were communicated to WBHO-I for action and resolution by the WBHO-I Community and Stakeholder Engagement Manager and documented in CONNECT. Community concerns and emerging issues were tracked using Main Roads' CRM ('CONNECT').

Proactive communications are developed to address key areas of interest and ensure the community was kept informed of project progress. Advanced notice was provided to residents for works with the potential to impact on the community, for example night works. The project team complies with the Main Roads Customer Service commitment of responding to all enquiries within 10 business days.

This stage of the project was being delivered in a remote region on a relatively tight schedule dictated by seasonal weather conditions in the East Kimberley. Traffic management is a critical focus, with the Great Northern Highway being a key freight route, and popular with tourists accessing sites such as the Bungle Bungles. A summary of these challenges is provided below:

- Access to a parking bay south of Spring Creek bridge was restricted due to passing lane construction in the area
- Bridge resurface at Spring Creek Bridge reduced traffic to one lane under stop/go controls
- Speed restrictions
- Detours (via side-tracks) were required to facilitate culvert construction
- Where culverts were extended without side-tracks, traffic was reduced to a single lane under stop/go traffic management

Heritage

An extensive Desktop Ethnographic Aboriginal Heritage Survey was undertaken within the project area (Brad Goode & Associates, 2018). No registered Aboriginal Heritage Sites or Places intersecting with the survey area were identified during the assessment. Methods for engagement with the local indigenous community are outlined in the Social Case Study below, including actions taken in the 2020/2021 reporting period.

Road Safety

Road safety was a key driver for the project, which will widen, reconstruct and realign the highway to further improve safety and efficiency for road users. A road safety audit was published in July 2021 covering the 5 year period to December 2019 (Shawmac, 2021). Recent crash history data indicated there were two reported crashes during this timeframe, one of which was a hospital severity. Both crashes occurred in dry conditions.

Treatments applied during construction following a project traffic risk assessment include:

- Development of project specific control plans for traffic flows (speeds and volumes) on the affected routes
- Temporary traffic controls for road uses including advance warning and directional signage
- Any Road Safety Barrier ends located within the clear zone are fitted with appropriately crash rated end-terminals to reduce consequence if impacted by an errant vehicle.

Traffic Management

Traffic modelling for the project has been undertaken by Main Roads. Effective traffic management and advanced notices of changed road conditions assisted in minimising risks associated with traffic management, allowing road users to plan journey times. Project Opportunities were identified early and included:

- Engagement – achieve best practice engagement and consultation with impacted communities by proactively sharing information; responding promptly to enquiries and identifying opportunities for meaningful community input to the project design and/or delivery.
- Messaging – secure community and road user support for the benefits the project will bring at completion.
- Community participation – identify opportunities for community involvement in aspects of the project, in particular to build on the successful engagement and upskilling of a local workforce. To achieve this the project team will work closely with the Warmun community, via the project's Aboriginal Liaison Officer.
- Documenting successes – ongoing documentation (photos, good news stories) to capture positive outcomes and project benefits.

Workforce Safety

The principal hazards for the workforce arose from interactions with road traffic and plant interface and heavy lifting. Particular attention was paid to a site-wide pre-start each day whereby all tasks were highlighted. Simple measures such as the daily notice boards and site plans assisted with communications.

Community Amenity

Community amenity has been improved mainly through local employment, which is discussed in the Economic Case Study, and improved road safety.

Additionally, as part of the road works WBHO-I upgraded the entrance to a Leycester's Rest, which containing a memorial for a young local who passed away. The rest area was named by the local Halls Creek community in honour of Rochford Leycester Devenish-Mearns who was killed in a single vehicle accident in 1999. The upgrades improved access to the rest area for the local community.

Diversity

WBHO-I's Equal Opportunity Policy ensures all staff and contractors are treated on equal basis, regardless of personal characteristics such as gender, race, religion, age, nationality, sexual preference and physical disability.

Aboriginal engagement and participation was a major focus for the project team, who worked closely with the local community of Warmun to create job opportunities and provide a culturally-sensitive working environment.

WBHO-I recognises and respects the Traditional Owners' continued connection to land, waters and culture. An overarching objective of the Aboriginal participation strategy was to maximise the participation of local Aboriginal peoples and businesses on the project.

The Aboriginal Participation targets and objectives were aligned with contractual requirements. These objectives included:

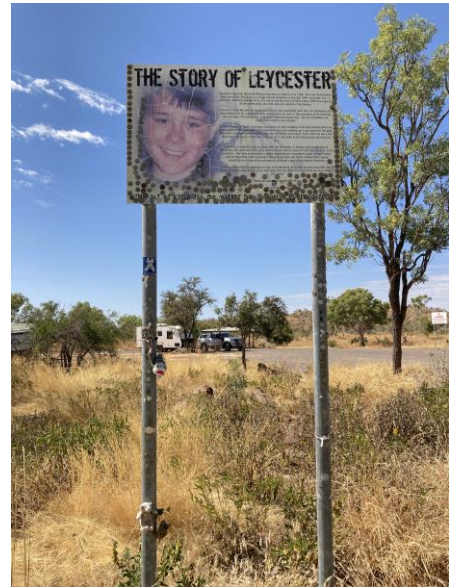
- Committing to meeting or exceeding Aboriginal employment and procurement targets
- Identifying suitable and diverse roles for Aboriginal persons
- Providing meaningful, long term Aboriginal employment initiatives
- Identifying opportunities to procure goods and services from Aboriginal businesses
- Clearly communicating procurement opportunities to Aboriginal Businesses
- Mentoring Aboriginal Persons and implementing cultural awareness training sessions.

During delivery of the project, WBHO-I reached unprecedented Aboriginal participation rates. An average of 32 per cent (25 per cent local, 7 per cent non-local) of the onsite workforce, and more than 15 per cent of contract spend went to Aboriginal businesses in the 2018 & 2019 calendar years.

The project provided training for many Aboriginal workers to enter the road construction industry and gain valuable skills and experience. Female diversity is a focus for WBHO-I in the roles of engineering, site administration, safety officers, environment and quality, HR and public relations.

Workforce Development

The project area is equidistant from Halls Creek and the community of Warmun, both located within the Shire of Halls Creek. This is a low-density location, with no immediate community adjacent to the works site that will be impacted. Based on the 2016 Census of Population and Housing, unemployment in the Shire of Halls Creek was reported to be 18.3% (Australian Bureau of Statistics



Leycesters Rest

[ABS], 2016). Employment benefits to the local indigenous communities are outlined in the Economic Case Study.

Case Study



SP2 Commencement Smoking Ceremony



Aboriginal people represent over 53% of the population within the Shire of Halls Creek (ABS, 2016). With this in mind, WBHO-I have prioritised strong relationship building and engagement with the local indigenous community throughout the duration of the project. A consultant from Optimal Personnel Services was engaged to benefit communication with traditional landowners within the region and ensure the contractor's participation in activities such as the smoking ceremony.

A Welcome to Country and smoking ceremony were conducted at both the commencement of SP1 and SP2, with the SP2 ceremony occurring within the 2020-2021 reporting period. This was attended by the contractors on site and facilitated by Patrick Mung from the Warmun Community.

Additionally, mentoring is available to indigenous employees is provided by Dadaru, a local indigenous business, contributing to creating a strong support system and team culture on the project. Employment benefits to members of the local indigenous communities are outlined in the Economic Case Study.

References

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Aecom 2016b. Great Northern Highway Upgrade SLK 2941-2950. Preliminary Environmental Impact Assessment & Environmental Management Plan.

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Department of Water (DoW), 2010. Kimberley Regional Water Plan 2010 – 2030. Retrieved from https://www.water.wa.gov.au/__data/assets/pdf_file/0017/5228/95832.pdf

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Rutgers University, 2019. "Keeping roads in good shape reduces greenhouse gas emissions." Retrieved from <https://www.sciencedaily.com/releases/2019/01/190115124451.htm>

Shawmac, 2021. Road Safety Audit: Great Northern Highway, Ord River to Turkey Creek Section 3 SLK 2941.15 to SLK 2950.00 – Side Tracks ST1 and ST2 TM Audit

Appendix 1 - List of Protected Areas Project interfaces with:

There are no Environmentally Sensitive Areas, Nature Reserves or any other conservation areas within or in the vicinity of the project Area. The nearest conservation area is Purnululu Conservation Reserve, which is located at least 23 km to the East of the project Area at its closest point. As a result, clearing did not impact on the environmental values of any conservation areas.

Appendix 2 - Protected fauna and flora species and habitat

The project area lies within the Central Kimberley bioregion of Western Australia. Pre-European vegetation mapping was undertaken by Beard (1979), who describes two vegetation associations within the project area:

- Bow River Hills, vegetation association number 808 (original map code: e16Lr p3Gc).
- Bow River Hills, vegetation association number 837 (original map code: e16Lr egc).

The project area is partially cleared of vegetation in areas where the original road exists.

Vegetation in and surrounding the project area is homogenous, with community structure grading from *Triodia* to *Sorghum* grasslands with mixed *Eucalypts*.

Two vegetation communities were described and mapped in the project area:

- Open Woodland over Speargrass on alluvial plains
- Open Woodland over Bunch Speargrass and Hummock Grassland on rocky soils.

Forty two Threatened, Priority or Migratory fauna species were identified from database searches. The following four species are considered likely to occur within the project area:

- Gouldian Finch (*Erythrura gouldiae*) (Endangered under the EPBC Act and Priority 4)
- Short-tailed Mouse (*Leggadina lakedownensis*) (Priority 4)
- Rainbow Bee-eater (*Merops ornatus*) (Migratory)
- Spectacled Hare-Wallaby (*Lagorchestes conspicillatus* subsp. *Leichardti*) (Priority 4).

Of these species only the Rainbow Bee-eater was recorded within the project area (AECOM, 2014).

References

Beard, J. S. 1979. Vegetation Survey of Western Australia, Kimberley. University of Western Australia Press.

AECOM Australia Pty Ltd (AECOM), 2014. Great Northern Highway SLK 2897-3008 Biological Survey 2014. Prepared for Main Roads Western Australia.

Appendix 3 – List of Stakeholders to the project

Stakeholder (as at 2019)	Relevance to Project
Federal Government Federal Minister for Infrastructure Michael McCormack	Providing funding
State Government Minister for Transport. Hon Rita Saffioti	Providing funding State Minister responsible for project delivery
State Government Department of Fire and Emergency Services (DFES)	Emergency access changes may be required during construction process Will be interested in retention of reliable access during construction and improved access post-construction
State Government Department of Environment	Protection of heritage areas and clearing approvals
State Government Department of Parks and Wildlife	Responsible for Purnululu National Park (Bungle Bungles)
Federal Member of Parliament Melissa Price	Project located in electorate
State Members of Parliament Member for Kimberley Josie Farrer MLA Mining and Pastoral Region: Ken Baston MLC Jacqui Boydell MLC Robin Chapple MLC Stephen Dawson MLC Kyle McGinn MLC Robin Scott MLC	Project located on the boundary of all noted members' electorates
Local Government Shire of Halls Creek Shire of Wyndham-East Kimberley	Project within Shire of Halls Creek region Project boundary with Shire of Wyndham-East Kimberley
Local communities Halls Creek Warmun	Nearest communities to project works area Local employment and training opportunities
Local businesses: Savannah Nickel Mine Springvale Station Alice Downs Station	Access during construction works
Tourism operators/visitor centres: Halls Creek Visitor Information Centre Purnululu Visitors Centre	Impact on tourism road users, particularly grey nomads

Bungle Bungle Caravan Park (Mabel Downs Station)	
Freight industry: MRWA Heavy Vehicle Operations Australian Trucking Association Road Trains Australia WA Road Transport Association	Important freight route Potential delays caused by works
Halls Creek District Hospital	Only hospital within 300kms of project area with an emergency department
Halls Creek Volunteer Fire and Emergency Services	Closest fire emergency services to work area
Road users	Delays caused by traffic management, including reduction to single lane and speed restrictions.

Appendix 4 – Glossary of Terms

Term	Meaning
BAM Act	<i>Biodiversity and Agriculture Management Act 2007</i>
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DGA	Dense Graded Asphalt
EMP	Environmental Management Plan
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
GRI	Global Reporting Initiative
GSP	Gross State Product
IS	Infrastructure Sustainability
ISCA	Infrastructure Sustainability Council of Australia
MRWA	Main Roads Western Australia
PMB	Polymer Modified Bitumen
RiSC	Roadside Impact Severity Calculator
SLK	Straight Line Kilometre
WA	Western Australia
WBHO-I	WBHO Infrastructure Pty Ltd
WC Act	<i>Wildlife Conservation Act 1950</i>

Appendix 5 – Sustainability Presentation



Sustainability Workshop End of Section 1.0 and into Section 2.0



Sustainability and the GNH Project

All works under the contract have been grouped within separable portions:

- Separable Portion 1: SLK: 2922.12 (CH: 122 120) to SLK: 2930.22 (CH: 130 220);
- Separable Portion 2: SLK: 2930.22 (CH: 130 220) to SLK: 2944.02 (CH: 144 024, as per the modified scope), with NO works on the existing upgraded highway between SLK: 2939.20 and SLK: 2941.15.

Achieving positive outcomes for the environment, the community and the economy.

When planning for and designing the Project Works, WBHO must simultaneously consider **social, environmental** and **economic** matters to ensure the Project Works are consistent with sustainability principles.

WBHO must implement the sustainability initiatives and achieve an Infrastructure Sustainability rating score of **50 'Silver' rating**.



Ord River North



The key benefits of the project are:

- Improved safety and access
- Increased productivity, freight reliability and efficiency for the transport industry
- Continued employment and business opportunities for the Kimberly region, local Aboriginal peoples and business

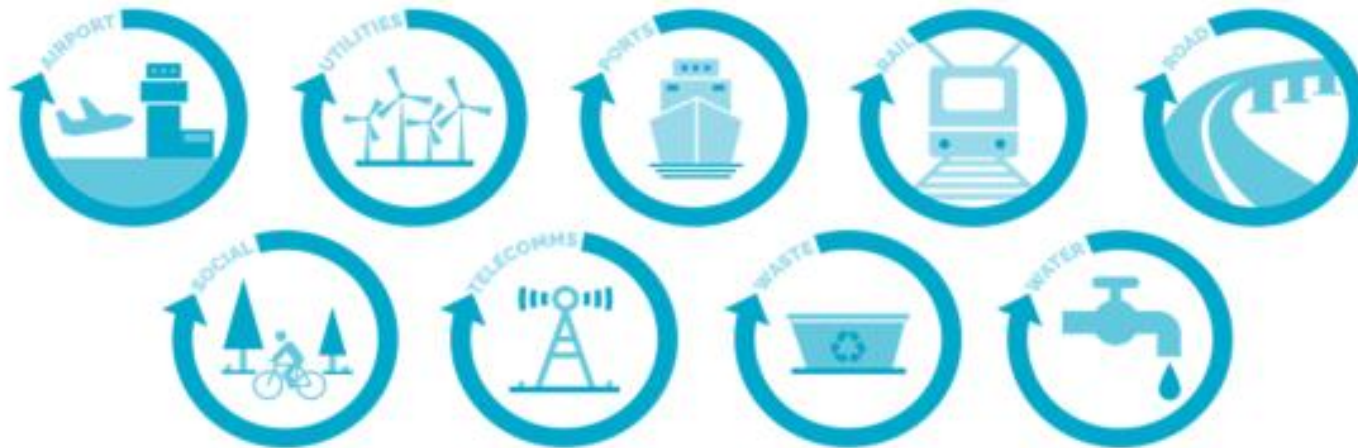
The Ord River North Project has and will continue to result in:

- Complement other significant road improvements in the region to improve safety and reduce journey times.
- Single season project completion for Separable Portion One (2019) and Separable Portions Two and Three (to follow)
- Reduce the number and severity of road traffic accidents, in line with the State Government's 'Towards Zero' policy, by widening the seal
- Reduce vehicle operating and maintenance costs due to an upgraded road surface that meets current design standards for this class of road
- Reduce travel times and improve journey time reliability
- Support economic growth with productivity benefits for freight and tourism
- Improved freight routes with road train turn around

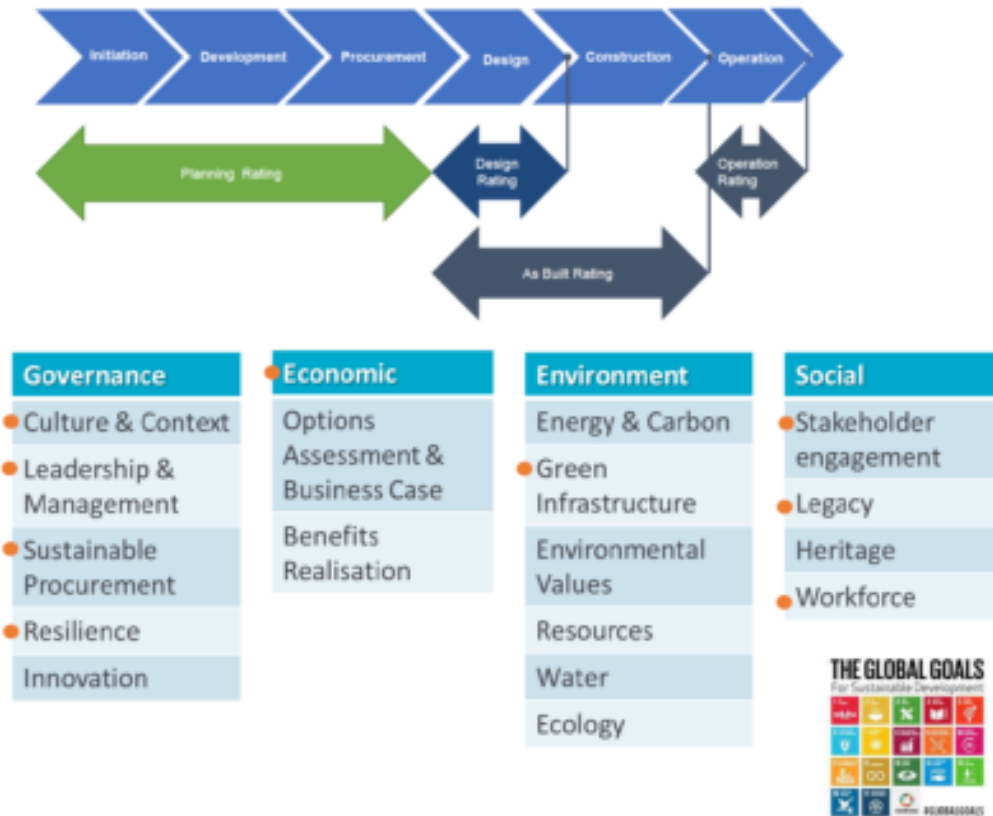
ISCA

Infrastructure Sustainability Council of Australia

- Non profit industry organisation
- Accreditation Scheme for projects
- Developed rating tool
- Training – Infrastructure Sustainability Accredited Professional (ISAP)
- Membership – MRWA



ISCA Scoring (Version 2.0)



Source : ISCA

Scope of Works and Technical Criteria

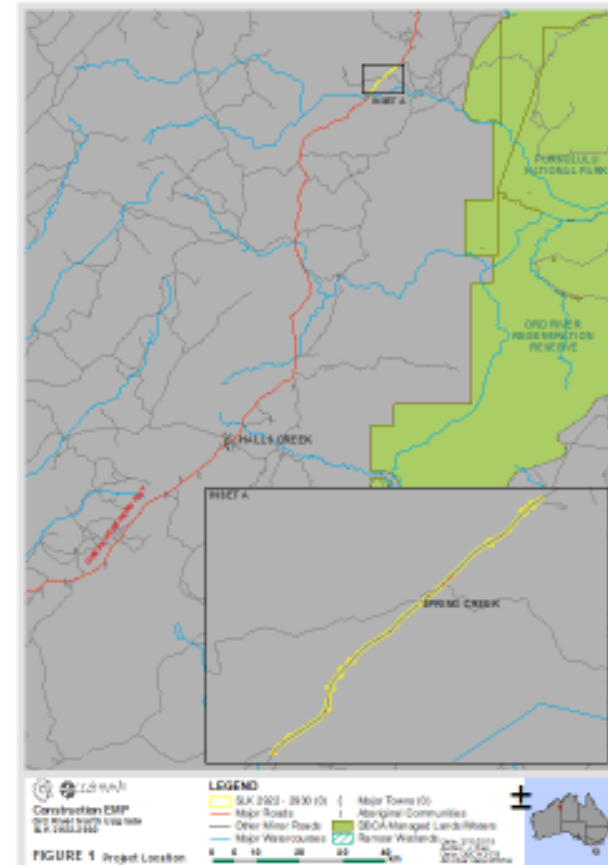
14.3 (a) The Contractor demonstrate the level of sustainable practice embedded within the Project Works and obtain design and as-built IS ratings for the Project.

- Scorecard
- Technical manual
- Base case
- Materials calculator
- Evidence
- ISAP

www.isca.org.au

Infrastructure Sustainability Credits

- (i) All Leadership and Management (Lea) credits – level 1;
- (ii) Ecn-1 Option Assessment – Level 1;
- (iii) Res-2 Climate and natural hazards – Level 2;
- (iv) Ene-1 Energy Efficiency – Level 1 and 5% reduction target;
- (v) Wat-1 Water Use – Level 1 and 5% reduction target;
- (vi) Rso-6 Material Lifecycle Impact Measure and Management – Level 1 and 5% reduction target;
- (vii) Rso-1 Resource Strategy Development – Level 1;
- (viii) Rso-4 Resource Recovery – Level 1;
- (ix) Leg-1 Leaving a Lasting Legacy – Level 1; and
- (x) Con-2 Urban and Landscape Design context – Level 1



Initiatives

- Management commitment to sustainability
- Commit to sustainable procurement and reward suppliers/sub-cons with similar commitment
- Commit to and implement rehabilitation outcomes
- Monitor energy and carbon use and meet reduction targets
- Monitor equipment and energy use
- Reduce water use through wet mixing of pavement materials using stabilisers
- Reduce water use through water efficiency measures in the office
- Use water from sustainable sources in preference to potable/scheme water by use of existing bores or surface water
- Reduce materials impact by re-using site materials and winning local materials.
- Ensure design alignment is closest fit possible to existing whilst maintaining Design Objectives. Minimise footprint outside limits of construction.
- Process existing seals/existing concrete from culverts
- Improve water flows through wetlands through improved drainage/culvert provision
- Engage local Aboriginal Community and wider local community for employment opportunities, skills improvement and business growth through implementation of the Aboriginal Engagement Plan
- Reuse of signage - signs deemed to be in good condition (no visible damage) should be re-used and not replaced.

Separable Portion 1: Local and Indigenous Employment



The project area is located on the Great Northern Highway in the Shire of Wyndham-East Kimberley.

Strong Indigenous employment and outcomes for the region, building on participation levels achieved at previous projects in the region such as Maggie Creek.

Ord River North: Heritage

While no sites of significance were found to be located within the project areas it is recommended that Main Roads implement a precautionary approach for any future works planned along this stretch of the Great Northern Highway



Sustainability



Sustainability requires WBHO to:

- **undertake a collaborative process to identify sustainability initiatives for the Project, based on Main Roads' Sustainability Policy**
- **develop a Sustainability Management Plan based on Main Roads' Sustainability Policy and Infrastructure Sustainability (IS)**
- **contribute to an improvement of Sustainability for the Project and infrastructure**



Ord River North: Earthworks



Heavy vehicle turnaround installed



Rehabilitation works

Water Source



A turkey's nest was constructed and water was carted from MRWA bores.

The following water sources were used:

- Bow River Quarry - Reserve 46647 – GWL167761(2) – 20,000KL Valid 2014 to 2025 (MRWA)
- Gibb River Road Reserve – GWL172775(2) – 54,000KL valid 2015 to 2025 (MRWA)
- McPhee's Quarry – Reserve 47077 – GWL 167763(2)
- Lot 28 on Plan 31698, King River Snake Creek, Hann River and Bryce Creek GWL 178397(1), SWL173090(4) and SWL 178396(1).
- Boolardy Station and Twin Peaks Station GWL203810 – expired 21/1/2021.

134,234 KL used for Section 1.0.



WBHO Batch Plant



Solar light
Clean and tidy



Ord River North: Site Offices



Site offices were hired and materials optimised

11x6 office

Water holding tank (4000)

6000L holding tank (grey water)

Furniture

Crib room

Toilet block

Good signage and emergency information



Ord River North: Power and Cyclone Rated



Self bunded generator for site

Tie down blocks for storm and cyclone events



Ord River North



Spill kits at crib rooms

First aid, safety and hydration



Ord River North: Knowledge Sharing Weeds



Calotropis (*Calotropis procera*) is a declared pest in Western Australia (WA) DAFWA



Bellyache bush

Ord River North: Borrow Pit and Batch Plant



Ticklara Creek Borrow Pit



Batch Plant Location after Decommissioning of Section 1.0

Ord River North: Bow River Quarry



Prescribed Premise Boundary



The Bow River Crushing Environmental Management Plan (CEMP) contains Main Roads Western Australia's (Main Roads) requirements for environmental management for the extraction, crushing, screening, washing and stockpiling of hard rock located on Great Northern Highway Gravel Reserve R46647 (Bow River Quarry).



Proposed Pit Expansion Area